



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/801,339	03/07/2001	Tong Chen	010025	4773

7590 02/06/2004

Mark G. Knedeisen, Esq.  
Kirkpatrick & Lockhart LLP  
Henry W. Oliver Building  
535 Smithfield Street  
Pittsburgh, PA 15222-2312

EXAMINER

TRAN, LONG K

ART UNIT	PAPER NUMBER
----------	--------------

2818

DATE MAILED: 02/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 09/801,339	Applicant(s) CHEN ET AL.	
	Examiner Long K. Tran	Art Unit 2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 - 22 is/are pending in the application.
- 4a) Of the above claim(s) 23 - 27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 - 22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
       Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
       Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \*    c) ☐ None of:  
         1. ☐ Certified copies of the priority documents have been received.  
         2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
         3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
     a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                            | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____   |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)        | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ | 6) <input type="checkbox"/> Other: _____                                    |

**DETAILED ACTION**

1. This office action is in response to the Response to Office Action filed on December 17, 2003
2. Claims **23 – 27** have been cancelled

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims **1 – 5, 7 and 10** are rejected under 35 U.S.C. 102(b) as being anticipated by Wakefield (US Patent No. 5,598,034).

Regarding claim **1**, figures 3 – 5 illustrate an apparatus comprising: a base 10; a device 13 or 113 connected to the base; and a cover 14 including a one-piece plastic body (col. 6, lines 22 – 35) and at least one electrically conductive lead 20, wherein the body is connected to the base such that the device is enclosed by the cover, and wherein the electrically conductive lead includes an exposed portion (inside the plastic body) electrically connected to the device via bonding wires 23 (it is noticed that the claimed language in claim 1 reciting: an exposed portion electrically connected to the device but not directly connected to the device).

Regarding claim **2**, figures 3 – 5 illustrate an inner surface of the body of the cover 14 and upper surface of the device 13 or 113 define a cavity 22 (col. 6, line 4).

Regarding claim **3**, figures 3 – 5 illustrate the inner surface of the body 14 includes a sidewall connected to the base.

Regarding claim **4**, figures 3 – 5 illustrate the device chip 113 is attached to rerouting board 30 (col. 8, lines 43 – 61).

Regarding claim **5**, figures 3 – 5 illustrate board 30 is made of same material as the chip 113 (col. 8, lines 50 – 52).

Regarding claim **7**, Wakefield discloses board 30 including a dielectric material (col. 8, lines 42 – 45).

Regarding claim **10**, figures 3 – 5 illustrate chip 13 is a semiconductor device.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim **9 – 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Wakefield (US Patent No. 5,598,034).

Regarding claim **9**, Wakefield discloses the claimed invention of claim 1 and further teaches the body including cap 25 (fig. 3) and cap 125 (fig. 5) when desired may be mirrored to aid in optical communication between optically coupled devices (col. 7, lines 35 – 41) and transparent lens widow 51 may be a body of any suitable material which transmits to wavelengths (col. 7, lines 49 – 61). Wakefield does not explicitly

teach the body cover includes liquid crystal polymer. It is known liquid crystal is commonly used to form the optical device as an optically clear material, so it is inherent that the optically clear material in Wakefield device can be liquid crystal polymer.

Regarding claims **10 – 13**, Wakefield discloses “For purpose of this disclosure, the terms “chip”, “die” and “circuit device” and the like are used interchangeably and are intended to cover all electronic circuit device configurations enclosed within a single housing package, regardless of whether such device configuration is in form of one or more pieces of semiconductor material and/or supporting interconnection structure” (col.1, lines 33 – 39). Therefore, it is inherent that Wakefield device also selected from group consisting of integrated circuit, an RF device and microwave (as cited in claim 11); a MMIC (as cited in claim 12); MEMs device (as cited in claim 12); and an optoelectronic device, a crystal device, an acoustic wave device and a capacitor (as cited in claim 13). In addition, it has been held that a recitation with respect to the manner in which a claimed apparatus (device selected from group consisting of integrated circuit, an RF device and microwave; a MMIC; MEMs device; and an optoelectronic device, a crystal device, an acoustic wave device and a capacitor) is intended to be employed does not differentiate the claimed apparatus (device 12) from prior art apparatus satisfying the claimed structural limitations. *Ex Parte Masham*, 2 USPQ F. 2d 1647 (1987).

7. Claims **6** and **8** is rejected under 35 U.S.C. 103(a) as being unpatentable over Wakefield (US Patent No. 5,598,034) in view of Tanaka et al. (U.S. Patent No. 5,097,318).

Regarding claims 6 and 8, Wakefield discloses the claimed invention of claims 1 and 5 except for at least one electrically conductive via extending from a first surface of the substrate to a second surface of the substrate; and at least one electrically conductive ball/bump connected to the electrically conductive via.

However, Tanaka et al. disclose solder bump 11 (fig. 8) connected to the conductor through-holes 4 (fig. 8) in order to change the wiring pattern design without changing the insulating base substrate and the insulating cover substrate.

At the time the invention was made, It would have been an obvious to one having ordinary skill in the art to include at least one electrically conductive via extending from a first surface of the substrate to a second surface of the substrate and at least one electrically conductive ball connected to the electrically conductive via. Applicant has not disclosed that at least one electrically conductive via extending from a first surface of the substrate to a second surface of the substrate and at least one electrically conductive ball connected to the electrically conductive via provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with either electrically conductive via or the out-leads 20 (Wakefield, figs. 3 & 5) or solder bump 11 (Tanaka et al., fig. 8) connected to the conductor through-holes because both methods provide an electrical connection between the device and the exposed portion of the leads to the other side of the base. Therefore, it would have been obvious to ordinary skill in this art to use conductor through-holes or electrically conductive bump to obtain the invention as specified in claims 6 and 8.

8. Claims **14 – 18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Wakefield (US Patent No. 5,598,034) in view of Choi (U.S. Patent No. 5,753,857).

Regarding claims **14, 15**, figures 3 – 5 illustrate an apparatus comprising: a base 10; a device 13 connected to the base; and a cover 14 including a one-piece plastic body (col. 6, lines 22 – 35) and at least one electrically conductive lead 20, wherein the body is connected to the base such that the device is enclosed by the body such that an inner surface of the body of the cover and an upper surface of the device define an air gap therebetween, and wherein the electrically conductive lead includes an exposed portion (inside the plastic body). Wakefield fails to teach an electrically conductive bump electrically connected between the device and the exposed portion of the electrically conductive lead.

However, Choi discloses the apparatus comprising a glass lid (fig. 2, 16), a conductive lead (fig. 2, 12) of the body (fig. 2, 10), and an electrically conductive bump 17b (Choi, fig. 2) between the exposed portion 13a (Choi, fig. 2) of the lead and the device.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use conductive bump instead of wire bond as taught by Choi for electrically connected between the device and the exposed portion of the electrically conductive lead in Wakefield device in order to connect the device and the wiring layers when the connection cannot be carried out by the wire bonding technique and to change the wiring pattern design without changing the insulating base substrate and the insulating cover substrate.

Regarding claim **16**, figures 3 – 5 (Wakefield) illustrate chip 13 or 113 is a semiconductor device.

Regarding claims **17** and **18**, Wakefield discloses “For purpose of this disclosure, the terms “chip”, “die” and “circuit device” and the like are used interchangeably and are intended to cover all electronic circuit device configurations enclosed within a single housing package, regardless of whether such device configuration is in form of one or more pieces of semiconductor material and/or supporting interconnection structure” (col.1, lines 33 – 39). Therefore, it is inherent that Wakefield device also selected from group consisting of integrated circuit, an RF device and microwave (as cited in claim 17); and a MMIC (as cited in claim 18). In addition, it has been held that a recitation with respect to the manner in which a claimed apparatus (device selected from group consisting of integrated circuit, an RF device and microwave; and a MMIC) is intended to be employed does not differentiate the claimed apparatus (device 12) from prior art apparatus satisfying the claimed structural limitations. *Ex Parte Masham*, 2 USPQ F. 2d 1647 (1987).

9. Claims **19 – 22** are rejected under 35 U.S.C. 103(a) as being unpatentable over Wakefield (US Patent No. 5,598,034) in view of Choi (U.S. Patent No. 5,753,857) and further in view of Chen et al. (US Patent No. 5,300,791) and Kuroda et al. (JP-40304844).

Regarding claims **19**, Wakefield and Choi disclose the claimed invention of claim 15. However they do not explicitly teach the device includes a GaAs substrate.

It is known and also taught by Chen et al. that optical device optical device (device related to emitted light) comprising GaAs is known and also taught by Chen et al. (a substrate of n-type GaAs 120 (fig. 1); col. 1, line 15). It is noted that Wakefield's device 13 or 113 can be an optical device, so it is inherent that the substrate in Glenn's device is a GaAs layer. It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the device with GaAs substrate in Glenn's device.

In addition, Wakefield and Choi do not teach and baseplate includes a metal selected from the group consisting of CuW and Cu/Mo/Cu.

Kuroda et al. disclose a CCD package comprising a die pad which consisting of non-alloy composite matter made by filling matter made by filling a specified amount of fused copper in a tungsten or molybdenum porous material are directly bonded together by soldering (abstract). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use CuW as a baseplate (die pad) in Wakefield's device (can be a CCD) as taught by Kuroda et al. in order to obtain a CCD package which has no warp-age and strain.

Regarding claim **20**, Wakefield discloses the claimed invention of claim 19 and further teaches the body including cap 25 (fig. 3) and cap 125 (fig. 5) when desired may be mirrored to aid in optical communication between optically coupled devices (col. 7, lines 35 – 41) and transparent lens widow 51 may be a body of any suitable material which transmits to wavelengths (col. 7, lines 49 – 61). Wakefield does not explicitly teach the body cover includes liquid crystal polymer. It is known liquid crystal is

commonly used to form the optical device as an optically clear material, so it is inherent that the optically clear material in Wakefield device can be liquid crystal polymer.

Regarding claim **21**, figures 3 – 5 (Wakefield) illustrate an inner surface of the body of the cover 14 and upper surface of the device 13 or 113 define a cavity 22 (col. 6, line 4).

Regarding claim **22**, figures 3 – 5 illustrate the inner surface of the body 14 includes a sidewall connected to the base.

### ***Response to Arguments***

10. Applicants' arguments have been fully considered but they are not persuasive.

Regarding claims 1, 14 and 15, Applicants argue that Wakefield fails to disclose "at least one electrically conductive lead" and "leads 20 disclosed by Wakefield are connected to bonding wires 23 **-not** to the device as recited in claim 1". The Examiner disagrees with this statement because the conductive leads (fig. 3,20) are part of the cover including a one-piece plastic body, and the leads 20 disclosed by Wakefield are electrically connected to the device (as cited in claim 1) via bonding wires 23 (it is noticed that the claimed language in claim 1 reciting: an exposed portion electrically connected to the device but not directly connected to the device). Applicants also argue that "Choi fails to teach or suggest this feature". The examiner disagrees with this statement because However, Choi discloses the apparatus comprising a glass lid (fig. 2, 16), a conductive lead (fig. 2, 12) of the body (fig. 2, 10), and an electrically conductive bump 17b (Choi, fig. 2) between the exposed portion 13a (Choi, fig. 2) of the lead and the device. Choi discloses an apparatus similar to that of Wakefield except the cover of Choi comprising a

glass lid and a plastic body and conductive bump. Therefore it is fair to say that one skilled in the art will recognize that combining the missing parts of Wakefield device with parts taught by Choi to provide a device as cited in claims 14 and 15.

For the above reasons, it is believed that the rejections should be sustained. Feature of an invention not found in the claims can be given no patentable weight in distinguishing the claimed invention over the prior art.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Long K. Tran whose telephone number is 571-272-1797. The examiner can normally be reached on Mon-Thu.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on 703-308-4910. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Art Unit: 2818

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-3329.

Long Tran



January 19, 2004



David Nelms  
Supervisory Patent Examiner  
Technology Center 2800